

## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

After amending the claims as set forth above, claims 1-3, 5, 6 and 9-13 are now pending in this application. Claims 12 and 13 are added and are supported by the current specification as discussed in further detail below.

### **35 U.S.C. 103 (a) Rejection**

In the Office Action dated February 23, 2007, claims 1-3, 5, 7 and 9-11 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tekeshita et al. (USP 5,145,835, hereinafter Tekeshita) and also over Mukai et al. (USP 5,462,920, hereinafter Mukai). However the previous Office Action of July 7, 2006 found allowable claims 4, 7, 8 and 11 over Tekeshita and Mukai. In response to the previous Office Action of July 7, 2006, and in reliance on the examiner's indication that claims 4 and 7 were allowable the applicants amended claim 1 to include the subject matter of claim 4 and amended claim 2 to include the subject matter of claim 7.

Thus, the currently pending Office Action of February 23, 2007 rejects claims that were previously found allowable over the Tekeshita patent and also over Mukai. These rejections are inconsistent with the previous allowance of the subject matter of claims 4, 7, 8 and 11. The rejections are respectfully traversed in light of the following remarks.

Independent claim 1 recites, among other features, a method of manufacturing a superconducting wire, including filling a raw material powder in a metal pipe, depressurizing the inside of the metal pipe; sealing an opening at an end portion of the metal pipe under the depressurized condition; wherein the packing density of the raw material powder is 10 percent or more and 40 percent or less; and wherein the depressurization speed is controlled at 2 kPa/min or less in the depressurization step.

Also, independent claim 2 recites, among other features, a method of manufacturing a superconducting wire, that includes filling a raw material powder in a metal pipe, the raw

material powder being composed of an oxide superconductor or a precursor to become an oxide superconductor through heat treatment; heating the metal pipe filled with the raw material powder to 400°C or more and 800°C or less; depressurizing the inside of the heated metal pipe to 100 Pa or less; wherein the packing density of the raw material powder is 10 percent or more and 40 percent or less; and wherein the depressurization speed is controlled at 2 kPa/min or less in the depressurization step.

Independent claims 1 and 2 are neither disclosed nor suggested nor made predictable by Tekeshita and/or Mukai. Both Tekeshita and Mukai fail to disclose, suggest or make predictable 1) the packing density of the raw material powder is 10 percent or more and 40 percent or less; and 2) the depressurization speed is controlled at 2 kPa/min or less in the depressurization step. Accordingly, the present claims were allowable (as set forth in the Office Action of July 7, 2006) over Tekeshita and Mukai.

1) The packing density of the raw material powder is 10 percent or more and 40 percent or less.

The rejected claims are allowable over the Tekeshita and Mukai patents because neither Tekeshita nor Mukai describe, suggest or make predictable a method in which the packing density of the raw material powder is from 10 - 40 percent, as recited in the presently pending claims. Both the Tekeshita and the Mukai reference fail to discuss the percentage of the packing density needed or required or recommended. Nevertheless, the Examiner stated that it would have been obvious to use the claimed percentage, but provided no factual evidence to support that argument.

On the other hand, the present application describes significant advantages relating to the 10 – 40 percent packing density feature (see, for example, page 10, line 9 to page 14, line 1) Specifically, if the packing density is less than 10 percent, the amount of the raw material powder is too small and, therefore, filling in the metal pipe is difficult. (Page 10, lines 11-13). On the other hand, if the packing density exceeds 40 percent, the amount of raw material is too large and, therefore, the following problems occur: 1) the gas permeability of the metal pipe becomes poor, not allowing degasification uniformly; 2) some parts are hardened due to

sintering and, thereby, the workability of the metal pipe becomes poor; 3) abnormal deformations may be caused during wire drawing. (Page 10 line 15 – page 11 line 2).

The advantages described in the present application, and the fact that the Tekeshita and Mukai references do not recognize such advantages is evidence that the 10-40 percent packing density feature is not obvious based on the Tekeshita and Mukai references. Therefore Tekeshita and Mukai references neither disclose, nor suggest nor make predictable claims 1 and 2 and thus, claims 1 and 2 are believed to be allowable.

2) The depressurization speed is controlled at 2 kPa/min or less in the depressurization step.

In particular, Takeshita and Mukai fail to teach, suggest or make predictable the claimed method, including a depressurization speed controlled at 2 kPa/min or less. In addition, Tekeshita does not disclose or suggest the benefits available with such a depressurization speed control, as described in the present application at page 11, lines 15-20.

If the speed exceeds 2 kPa/min, the pressure within the interstices of the raw material powder in the pipe cannot change in accordance with the depressurization speed, and therefore, the raw material powder may be blown up in the metal pipe and spout from the pipe.

The lack of disclosure in Tekeshita and Mukai for the above feature is also acknowledged by the Office Action of February 23, 2007, where it is stated that:

Tekeshita et al do not teach any specific depressurization speeds. This is because a PHOSITA [person having ordinary skill in the art] would determine, by use of ordinary skill in this art, the depressurization speed range which is recited in claims 1 and 2 for the method of manufacturing of a superconducting wire.

Without knowledge of any beneficial effect of a controlled depressurization speed as claimed, one of ordinary skill in the art would seek to depressurize at a high speed, to minimize manufacturing time and would not have considered a depressurization speed of 2

kPa/min or less. Therefore claims 1 and 2 are believed to be allowable over the Tekeshita and Mukai references.

3. The present claims were allowable in the Office Action of July 7, 2006 over Tekeshita and Mukai.

Lastly, the rejected claims are at least allowable for the same reasons that they were found allowable in the Office Action of July 7, 2006, and no new facts have been made of record that would change the previous allowance of those claims. It is noted that the Examiner had already considered the portion of the Tekeshita and Mukai references that relates to vacuum and still found claims allowable over that patent (see last office action page 2 lines 8 and 9). Furthermore, Applicant had relied upon the Examiner's previous allowance of claims 4, 7, 8 and 11, to place the application in condition for allowance.

Since the time of the previous allowance of the application, the Examiner has cited no new facts or information of record that could have changed the Examiner's previous allowance of claim 4, 7, 8 and 11.

Thus, the features of independent claims 1 and 2 (which incorporate previously allowable claims 4 and 7, respectively), are neither disclosed nor suggested nor made predictable by Tekeshita and Mukai. Therefore independent claims 1 and 2 are believed to be patentable over Tekeshita and Mukai. Dependent claims 3, 5-6 and 9-13, are believed to be allowable for at least the same reasons indicated above with respect to the independent claims from which they depend.

**New Claims**

New claims 12 and 13 further emphasize differences between the current disclosure of the present application and the Tekeshita and Mukai patents.

Dependent claim 12 recites a method of claim 1 further comprising heating the metal pipe filled with raw material powder after filling the powder material in the pipe and before depressurizing. Advantages of heat treating before depressurization are described in the present application, on page 12. In contrast, Tekeshita describes sealing the metal casing in a

vacuum and then, after the metal casing is sealed, subjecting the metal casing containing the powder to a hot isostatic press treatment. Thus, heating of the Tekeshita metal casing occurs after it is sealed (i.e., after any depressurization of the powder occurs).

Dependent claim 13 recites a method of manufacturing a superconducting wire according to claim 1, where the depressurizing comprises depressurizing to the pressure of 100 Pa or less. In contrast, Tekeshita refers to sealing the metal casing in a vacuum, but does not specify the pressure of the vacuum.

**Conclusion:**

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

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